CLAIMS

1	1.	A method of backing up and restoring data in a computer system, the method	
2	comprising:		
3		defining a logical backup object;	
4		specifying one or more collapsed extents; and	
5		recording details of the collapsed extents.	
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1	2.	The method of claim 1 further comprising:	
2		starting data movement between a host and the backup and restore system; and	
3		monitoring data movement.	
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1	3.	The method of claim 2 further comprising:	
2		receiving a completed signal; and	
3		in response to the completed signal, halting the monitoring of the data movement.	
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1	4.	The method of claim 2 further comprising repeatedly defining a logical backup	
2	object	, specifying extents, starting data movement, recording details of the specified	
3	extents and monitoring data movement from a first storage unit to a second storage unit		
4	until all data is transferred to the second storage unit.		
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1	5.	The method of claim 2 further comprising restoring data by:	
2		creating empty objects to restore into;	
3		discovering the extents of the empty objects;	
4		reading the extents of the backup objects; and	
5		specifying a mapping from backup extents to restore extents wherein at least one	
6	of the extents corresponds to a collapsed extent.		
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1	6.	A method of backing up data used in a computer system having a client, a primary	

2	storage system and a backup storage system, the method comprising.	
3	discovering one or more actual extents on the primary storage system;	
4	collapsing the extents; and	
5	specifying the collapsed extents to the backup storage system.	
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1	7. The method of claim 6 wherein collapsing the extents comprises:	
2	identifying a pattern in the actual extents discovered on the primary storage	
3	system; and	
4	generating a representation of files specified by the actual extents which is more	
5	compact than the representation provided by the actual extents and defining the	
6	representation as a collapsed extent.	
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1	8. A method of restoring data from a backup and restore system to a host, the	
2	method comprising:	
3	creating empty objects on host to restore into;	
4	discovering the extents of the empty objects;	
5	reading the extents of the backup objects; and	
6	specifying a mapping from backup extents to restore extents wherein at least one	
7	of the extents corresponds to a collapsed extent.	
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1	9. The method of Claim 8 wherein specifying a mapping comprises specifying pairs of	
2	extents which identify the backup extents and the restore extents.	
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1	10. The method of Claim 8 wherein specifying a mapping comprises:	
2	identifying whether both back up and restore extents is striped;	
3	in response to both the back up and restore extents being striped, identifying	
4	whether both back up and restore extents have the same column width and column coun	
5	in response to both the back up and restore extents being striped, identifying	
6	whether both back up and restore extents start at the beginning of a stripe element;	
7	compute a number of repetitions; and	

8		generate a single restore extent for the number of repetitions.
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1	11.	The method of Claim 8 further comprising:
2		monitoring data movement.
3		receiving a complete signal; and
4		in response to the completed signal halting the monitoring of the data movement.
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1	12.	A backup and restore system for backing up and restoring files to and from a
2	prima	ry storage system coupled to a client, the backup and restore system comprising:
3		a processor for defining a logical backup object;
4		a collapsed extent processor for specifying collapsed extents;
5		means for starting data movement; and
6		an extent recording processor for recording details of collapsed extents.
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1	13.	The system of claim 11 further comprising means for logically restoring a logical
2	eleme	ent from a segment of storage on the primary storage system.
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1	14.	The system of claim 12 further comprising a processor for specifying a mapping
2	from	backup extents to restore extents wherein at least one of the extents corresponds to a
3	collapsed extent.	
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1	15.	The system of claim 13, wherein said means for logically restoring comprises:
2		means for creating empty objects to restore into;
3		means for discovering the extents of the empty objects;
4		means for reading the extents of the backup objects; and
5		means for specifying a mapping from backup extents to restore extents wherein at
6	least o	one of the extents corresponds to a collapsed extent.
1		
1	16.	The system of claim 13, wherein the means for logically restoring comprises means
2	for sp	ecifying pairs of extents which identify the backup extents and the restore extents.